

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-20 are presently active in this case, Claim 1 amended, and Claims 8-20 added by way of the present amendment.

In the outstanding Office Action, Claims 1-3 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 1142619 to Ohno et al. in view of U.S. Patent No. 6,395,370 to Noda et al. and Applicants admitted prior art (hereafter “Background Art”); and Claims 4 and 6-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohno et al., Noda et al., Background Art, and further in view of U.S. Patent No. 6,040,266 to Fay III et al.

First, Applicants wish to thank Examiner Young and Supervisory Patent Examiner (SP) Griffin for the October 22, 2008 personal interview at which time the outstanding issues in this case were discussed. During the discussion, Applicants presented amendments and arguments substantially as indicated in this response. While no agreement was reached, the Examiners indicated that they understood the importance of the claimed L/I relationship in the crisscross portion, and would consider the patentability of this feature upon filing of a formal response. Further, the Examiners indicated that full consideration would be given to added dependent claims which emphasize structural features of the crisscross portion.

Turning now to the merits, Applicants’ invention is directed to a honeycomb filter for purifying exhaust gases. As seen in the example of Figure 1 of Applicants’ specification, such a honeycomb filter includes a plurality of porous ceramic members 20 joined to one another in a ceramic block 15 by sealing material 14 such that a crisscross portion 11 is formed at intersections of the sealing material 14. As also seen in Figure 1, the joined ceramic members 20 are coated with a sealing material layer 13 which is provided to prevent

exhaust gases from leaking from a circumferential portion of the ceramic block 15. As discussed in Applicants' specification and in the October 22 personal interview, the present inventor recognized that the sealing material 13 provides an inward compression force to compress the crisscross portion such that it becomes possible to improve the durability against wind erosion and cracks.¹ Thus, Applicants' invention is directed to a particular configuration of the crisscross portions of a ceramic filter having an outer sealing material layer such that wind erosion and the formation of large depressions can be minimized at the crisscross portion.²

In particular, the invention of pending Claim 1 recites a honeycomb filter for purifying exhaust gases, the filter including a ceramic block having a plurality of rectangular columnar porous ceramic members combined with one another by a sealing material layer. Each of the rectangular columnar porous ceramic members has a plurality of throughholes extending parallel with one another in a length direction of the ceramic block and separated by a partition wall interposed between the throughholes. A circumferential sealing material layer is formed on a circumference portion of the ceramic block. Also recited is that the partition wall functions as a filter for collecting particulates and on a cross section perpendicular to the length direction of the ceramic block, the sealing material layer includes at least one crisscross portion in which a maximum width L of the crisscross portion of said sealing material layer is 1.5 to 3 times greater than a minimum width l of said sealing material layer.

Thus, Applicants Claim 1 recites the honeycomb filter having a circumferential sealing material layer and also at least one crisscross portion having a L/l relationship of 1.5 to 3. As discussed in the April 24, 2008 amendment and in the October 22 interview, the

¹ Applicants' published specification U.S. 2005/0180898 at paragraph [0042].

² Applicants' specification at paragraph [0008].

present inventors conducted numerous experiments to discover that this cited relationship L/l , in a filter having a circumferential sealing layer provides a synergistic effect of reducing wind erosion. In particular, Table 1, Table 2 and Table 3 in Applicants' specification summarize experimental results which demonstrate the superior wind resistance provided by a crisscross portion having the L/l relationship recited in Claim 1. Further, the claimed relationship of the present invention applies to configurations other than that of Fig. 3(a). Specifically, Figures 3b, 3c, and 4a-4c show further examples of the present invention wherein the L/l relationship is met to provide the advantages of the present invention. Further, equations 1 through 6 in Applicant's specification define a relationship L/l value to a characteristic (such as R , C or α) of a corner for different configurations.

The cited reference to Ohno et al. also discloses a honeycomb filter assembly for filtering exhaust gas. Figure 13 of Ohno et al. discloses an assembly having filter blocks connected to one another by way of a sealing layer 15, and having a sealing layer 16 provided around a circumference of the assembly. Figure 8 of Ohno et al. also discloses that the filter blocks 18 can have rounded corners in order to prevent chipping or cracking of the corners. As discussed in the October 22 interview, however, Ohno et al. does not disclose the relationship L/l 1.5 to 3.0. In particular, each of examples 2-1 through 2-5 in Ohno et al. disclose a thickness of the sealing material at 1.0 mm and a chamfered surface of 1.5. When these values are applied to equation 1 of Applicant's specification (which is associated with the rectangular rounded corner configuration), the result is a L/l value of 4.123 for the Ohno et al. configuration. This is clearly outside the claimed range of 1.5-3.5. Thus, Ohno et al. does not disclose a relationship L/l as recited in Applicants' Claim 1.

Moreover, as discussed in the October 22 interview, the L/l relationship is not obvious from the disclosure of Ohno et al. In particular, Ohno et al. discloses that the curvature of the round surface 18 can be 0.3-2.5 mm and a thickness of the sealing material at

.3-3 mm. However, these ranges provide an infinite number of L/l combinations only some of which could meet the claimed L/l range. It is the present inventor who discovered that a specific relationship L/l (1.5-3.0) provides an advantage of preventing wind erosion of crisscross portions of the filter assembly. Ohno et al. does not teach or suggest this feature.

In addition, the secondary reference to Noda et al. merely discloses a filter assembly wherein the sealing material between adjacent filter components can be changed in thickness. There is no disclosure in Noda et al. of the above-identified L/l relationship. Finally, the Background Art of Applicant's specification discusses the structure of the filter assembly generally, but does not disclose the claimed L/l relationship. If anything, the Background Art discussion of the wind erosion problem teaches away from a specific L/l relationship.

Therefore, Applicants' independent Claim 1 patentably defines over the cited references. As Claims 2-20 depend from Claim 1, this claims also patentably define over the cited references. Nevertheless, Applicants' submit that the dependent claims provide a further basis for patentability over the cited references as discussed in the October 22nd interview.

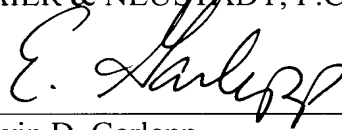
Specifically, new Claims 8-13 recite additional structural features of a rectangular columnar porous ceramic member configuration, such as having curved or flat chamfered corners and a particular length of chamfered corner for values L/l 1.5-3. While Ohno et al. discloses this rectangular shape, as noted above, Ohno et al. does not disclose meeting the L/l relationship, and therefore this reference does not disclose the additional features in Claims 8-13 associated with the L/l relationship. Similarly, Ohno et al. does not disclose the additional features in Claims 14-15 associated with a hexagonal ceramic member. Claims 16-19 recite a rhombic shaped ceramic member without a chamfered corner, or a triangular shaped ceramic member *without* a chamfered corner. While Ohno et al. mentions rectangular and rhombic shaped ceramic members, Figures 11 and 12 show each of these members *having* a

chamfered corner. Finally, Claim 20 recites that all of the crisscross portions meet the claimed relationship L/l. As discussed in the Office Action, only some of the ceramic members in Noda et al. include a different thickness of sealing member there around. Even assuming that this would meet the claimed L/l relationship, it certainly would not meet the relationship for all ceramic members as now recited in Claim 20. Therefore, Claims 8-20 provide additional basis for patentability over the cited references.

Consequently, in view of the present amendment, no further issues are believed to be outstanding and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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